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25 September, 2000

PROGRESS REPORT Project Number 14-35-01-99-CT 30980

PROGRESS REPORT TO 31st August 2000

1. The Draft Report for the Biological Impact prepared by Marine Ecological Surveys Ltd has been integrated with the results collected to date by Coastline Surveys Ltd.

2. The Biological Impact results clearly ascertain and summarise the primary concerns with non-screening dredging operations.

3. Areas of limited information have been identified (nominally in the near-field effects, much closer than was originally anticipated).

4. It was intended and approved by the co-workers that the fieldwork planned for August would address the issues raised in (3) above with collection of a few seabed samples at the site of dredging operations at no further cost to the project. Additional sidescan sonar mosaicing and seabed correlation would investigate the very near field effects.

5. As communicated to MMS in August, the planned field operations were again thwarted, this time by damage to the participating dredger whilst transiting to the research site. The nature of the repairs required immediate dry-docking of the vessel in Holland.

6. As a result of the dredger incident, two days of field surveys conducted immediately prior to the arrival of the dredger (sidescan sonar, seabed sampling, ADCP profiling, water sampling and video imaging) will have to be largely repeated at the next available opportunity.

7. Physical observations clearly indicate the nature and extent of seabed disturbances. There is anecdotal evidence of seabed changes between the various data collection exercises that have been undertaken with the sidescan sonar mosaicing system. It is hoped that further analysis of the data will yield information on the potential timescales for physical seabed recovery

RESULTS OBTAINED TO DATE

1 The two phases of field sampling have determined with considerable detail the benthic community composition within and adjacent to the actively dredged area, in the fallout "halo" zone and in the far field.

2 The species diversity, population density and biomass of benthic macrofauna are typical of those recorded by similar methods in coastal waters

3 Surrounding the intensively dredged area is an elongated zone or “halo” of enhanced species diversity, population density and benthic biomass which corresponds to the principal axis of dispersion of materials in the outwash by the tidal currents.

4 The average biomass of benthic macrofauna in the survey site as a whole is equivalent to 4.06grams Carbon per m^2 and that in the zone of enhancement surrounding the dredged area is 17 grams carbon per m^2.

5 A programme of sampling of the overspill issuing from a typical commercial dredging operation on the site has been completed. The laboratory analysis of the samples was designed to determine the organic content of the outwash.

6 Comparison with the *in situ* organic content in and around the dredge zone has enabled contours of organic enrichment to be determined.

7 The detailed sidescan sonar mosaicing programme of the second phase has clearly identified large pits, 6-8m deep, often superimposing on each other. Smaller circular pits are evident away from the primary zone. This pattern reflects the underlying geology and the tendency to concentrate activity on the best resource “Sweet spot”.

8 Trailer dredging is limited in extent, to the north east of the anchor dredge site and although present, is generally less well defined. Correlation between age and appearance of the dredge tracks is being investigated.

9 Only minor evidence of downstream development of microtopographical seabed features such as sand ripples or patches is evident. This is confined to the immediate vicinity of the dredge operation and is largely as expected.

10 Observations from this and other aggregate extraction licences in the UK would indicate that operations with substantial screening activities would produce ‘fields’ of ripples and sand patches extending downstream, sub-parallel to the tidal streams and more extensive in the direction of net sediment transport.

11 Detailed assessment of the dredge tracks for the past 8 years has been completed, assessing every dredge trail which has disturbed the seabed at each of the 130 plus sampling locations.

12 The biological response to anchor dredging with limited screening appears restricted to a zone within 100-150m downstream from the dredge site.

13 The biological response to trailer dredging is less clear, which may in part be both due to the limited quantity of trailer dredging undertaken and, potentially, the less disturbing operation.

PLANNED WORK SCOPE FOR NEXT QUARTER

1 A detailed ADCP profile of the site during a typical commercial operation will be undertaken. Earlier efforts have been thwarted by equipment and weather problems and latterly dredger problems. A further effort has been planned for early October.

2 During the ADCP data collection detailed photographic images of the seabed will be acquired if turbidity allows.

3 Additional sidescan sonar data will also be collected in order to assess the time variance of the seabed topography. Estimates of physical recovery can then be made.

4 Preparation of an interim report has been delayed due to waiting for ADCP data on the plume morphology from typical dredging operations at the site. When this has been collected the interim report will be produced unless weather conditions delay the progress unnecessarily.